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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 16

Application Number: 09/317,480
Filing Date: 5/24/1999
Appellant(s): Peele

Edward H. Green, III
For Appellant

SUPPLEMENTAL EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 1/16/2002.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-9 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

6,047,186	Yu, et al.	4-2000
5,809,423	Benveniste	9-1998
6,119,011	Borst et al	10-2000
5,960,351	Przelomiec	10-1999

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US 6,047,186 A) in view of Benveniste (US 5,809,423 A).

Regarding claim 1, Yu et al. discloses a method for allocating channels in a cellular communication system having a plurality of cells comprising: a. dividing the cell into a plurality of sectors (column 4 line 63 to column 5 line 6); b. subdividing channels allocated to the cell into

frequency subgroups (column 4 line 63 to column 5 line 31); c. assigning the frequency subgroups to respective sectors in the cell (column 4 line 63 to column 5 line 31). However, Yu et al. does not disclose d. allocating channels within each sector to users in the corresponding sector; and e. when the number of channels allocated in a first sector of the cell reaches a predetermined threshold, reassigning an unused channel from a second sector in the cell to the first sector. Benveniste discloses d. allocating channels within each sector to users in the corresponding sector (base stations serving cells communicate to users via radio links (column 1 lines 16 to 20); and e. when the number of channels allocated in a first sector of the cell reaches a predetermined threshold, reassigning an unused channel from a second sector in the cell to the first sector (cell checks if there are any free allocated channels within the cell or sector) (column 3 lines 12 to 19, column 9 lines 31 to 44). It would have been obvious to combine the teachings of Yu et al. and Benveniste. Combining the teachings of Yu et al. and Benveniste would provide a method in which channels can be allocated in an efficient matter maximizing traffic capacity.

Regarding claim 2, Yu et al. in view of Benveniste disclose all of the limitations as set forth in claim 1. Benveniste further discloses further including the step of further reassigning the reassigned channel back to its original sector when the reassigned channel is demanded in the original sector (column 9 lines 55 to 67).

Claims 3,6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US 6,047,186 A) in view of Benveniste (US 5,809,423 A) in further view of Borst et al. (US 6,119,011 A).

Regarding claim 3, Yu et al. in view of Benveniste disclose all of the limitations as set forth in claim 1. Borst et al. discloses determining whether the unused channel in the second cell is in use in another co-channel cell (busy channel table) in the network before the unused channel is reassigned to the first sector (column 6 lines 57 to 65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yu et al. in view of Benveniste, with the teachings of Borst et al. Combining the teachings of Yu et al. in view of Benveniste, and the teachings of Borst et al. would determine whether a unused channel in any cell/sector which could be beneficial to minimize channel interference.

Regarding claim 6, Yu et al. discloses a method for allocating channels in a cellular communication system having a plurality of cells comprising: a. dividing the cell into a plurality of sectors (column 4 line 63 to column 5 line 6); b. subdividing channels allocated to the cell into frequency subgroups (column 4 line 63 to column 5 line 31); c. assigning the frequency subgroups to respective sectors in the cell (column 4 line 63 to column 5 line 31); (g) reassigning the unused channel from the second sector in the cell to the first sector in the cell if the unused channel is not currently in use in the co-channel cell (column 6 lines 57 to 65). However, Yu et al. does not

disclose d. allocating channels within each sector to users in the corresponding sector; and e. when the number of channels allocated in a first sector of the cell reaches a predetermined threshold, determining whether unused channels are available in a second sector of the cell; and (f) if an unused channel is found in the second sector, determining whether the unused channel is currently in use in another co-channel cell in the network. Benveniste discloses d. allocating channels within each sector to users in the corresponding sector (base stations serving cells communicate to users via radio links (column 1 lines 16 to 20); and e. when the number of channels allocated in a first sector of the cell reaches a predetermined threshold, reassigning an unused channel from a second sector in the cell to the first sector (cell checks if there are any free allocated channels within the cell or sector) (column 3 lines 12 to 19, column 9 lines 31 to 44). However, Benveniste does not disclose (f) if an unused channel is found in the second sector, determining whether the unused channel is currently in use in another co-channel cell in the network. Borst et al. discloses (f) if an unused channel is found in the second sector, determining whether the unused channel is currently in use in another co-channel cell in the network (column 6 lines 57 to 65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yu et al. in view of Benveniste, with the teachings of Borst et al. Combining the teachings of Yu et al. in view of Benveniste, and the teachings of Borst et al. would determine whether a unused channel in any cell/sector which could be beneficial to minimize channel interference.

Regarding claim 7, Yu et al., in view of Benveniste, in further view of Borst et al. disclose all of the limitations as set forth in claim 1. Benveniste further discloses further including the step of further reassigning the reassigned channel back to its original sector when the reassigned channel is demanded in the original sector (column 9 lines 55 to 67).

Claims 4,5,8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu et al. (US 6,047,186 A) in view of Benveniste (US 5,809,423 A) in view of Borst et al. (US 6,119,011 A) in further view of Przelomiec (US 5,960,351 A).

Regarding claim 4, Yu et al. in view of Benveniste in further view of Borst et al. disclose all of the limitations as set forth in claim 3. However, Yu et al. in view of Benveniste in further view of Borst et al. do not disclose further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last used. Przelomiec discloses further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last used (column 8 lines 12 to 61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yu et al. in view of Benveniste, in further view of Borst et al. with the teachings of Przelomiec. Combining the teachings of Yu et al. in view of

Benveniste, in further view of Borst et al. and the teachings of Przelomiec would indicate the last channel that should be used which would reduce potential interference problems.

Regarding claim 5, Yu et al. in view of Benveniste in view of Borst et al., in further view of Przelomiec disclose all of the limitations as set forth in claim 3. Benveniste further discloses further including the step of further reassigning the reassigned channel back to its original sector when the reassigned channel is demanded in the co-channel cell (column 9 lines 55 to 67).

Regarding claim 8, Yu et al., in view of Benveniste, in further view of Borst et al., disclose all of the limitations as set forth in claim 6. However, Yu et al. in view of Benveniste in further view of Borst et al. do not disclose further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last used. Przelomiec discloses further including the step of placing the reassigned channel on a hold back list in the co-channel cell designating channels that should be among the last used (column 8 lines 12 to 61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Yu et al. in view of Benveniste, in further view of Borst et al. with the teachings of Przelomiec. Combining the teachings of Yu et al. in view of Benveniste, in further view of Borst et al. and the teachings of Przelomiec would indicate the last channel that should be used which would reduce potential interference problems.

Regarding claim 9, Yu et al. in view of Benveniste in view of Borst et al., in further view of Przelomiec disclose all of the limitations as set forth in claim 8. Benveniste further discloses further including the step of further reassigning the reassigned channel back to its original sector when the reassigned channel is demanded in the original sector (column 9 lines 55 to 67).

(11) Response to Argument

Appellant argues the following:

A: The Examiner's reliance on the Yu reference is improper, since Yu, when considered as a whole, teaches away from the present invention. The Examiner has not considered Yu as a whole, but rather has selectively extracted elements from Yu to reject the Applicant's claims.

B: The Examiner's rejection based on the Benveniste reference relies on argument by insufficiently substantiated analogy.

As per A: The citation of Yu is to establish the environment, i.e. a sectorized cellular system with the allocation of fixed frequencies among sectors of a cell. Thus the Examiner agrees with the appellant that Yu teaches the crafting of a fixed allocation of channels to sectors of cell and does not disclose dynamic allocation of channels among sectors.

The appellant primarily argues that Yu inherently teaches away from the adaptive allocation of channels and the applicant's invention. In support of the appellant's argument the appellant makes two points. First, the appellant argues that Yu expresses no concern for co-channel interference, for the relative loading among sectors, or for spectral efficiency (page 8

of appellant's brief). Second, the appellant argues that the complexity and computational intensity of Yu's sector channel allocation algorithm dispel any notion that Yu envisioned, contemplated, or could possibly implement the dynamic allocation of channels among sectors on an as-needed basis (page 8 appellant's brief).

Regarding the appellant's first point, the Examiner disagrees. At the least, Yu states that co-channel (channel to channel) interference is a limiting factor in the number of channels available in a system and is the chief reason for implementing the cellular and frequency reuse concepts (column 1 lines 39-64). Thus by using cellular and frequency reuse concepts, Yu inherently is concerned with co-channel (channel to channel) interference. Further, even if Yu does not expresses concern for co-channel interference, for the relative loading among sectors, or for spectral efficiency, the appellant does not indicate why such a lack of express concern would render Yu as teaching away from adaptive allocation of channels or the applicant's invention. Therefore the appellant has not proved that Yu inherently teaches away from the adaptive allocation of channels or the applicant's invention.

Regarding the appellant's second point, the Examiner agrees that Yu does not teach, suggest or contemplate dynamic allocation of channels among sectors, but instead teaches fixed allocation of channels among sectors. Further, the appellant has not indicated why Yu being computationally intensive would render Yu as teaching away from adaptive allocation of channels or the applicant's invention. On the other hand, the statement does proves that Yu, by itself, does not anticipate the applicant's invention. However, the examiner does not rely

solely on Yu. Thus the appellant has not proved that Yu inherently teaches away from the adaptive allocation of channels or the applicant's invention.

Despite the appellant's assertion that Yu inherently teaches away, Benveniste evidences that Yu does not teach away from the adaptive allocation of channels. In Benveniste it is discussed that there are two categories of channel allocation, fixed and flexible (column 1 lines 17-60). Benveniste further breaks down fixed channel allocation into regular and non-regular types of channel allocation (column 1 lines 17-60). Briefly, channel allocation is derived from the need to efficiently use the available radio spectrum through reuse of the same radio frequencies in designed co-user cells that are sufficiently separated by distance so that combined interference generated by all co-user cells is below tolerable levels (column 1 lines 17-60). Regular fixed channel allocation is the assignment of radio frequencies to cells based upon regularity assumptions (i.e., equal-sized regularly-spaced cells with uniformly distributed traffic loads), which enable the adoption of simple rules for identifying co-user cells, and for partitioning the RF spectrum into channel sets (column 1 lines 17-60). Non-regular fixed channel allocation is the assignment of radio frequencies to cells based upon rules modified to real world situations, wherein the regularity assumptions used in regular fixed channel allocation do not hold, such that efficient utilization of the RF spectrum in the real world is achieved (column 1 lines 17-60).

Yu discloses a non-regular fixed channel allocation system. As conceded by the appellant, Yu teaches fixed channel allocation taking into account real-world performance

characteristics. Since Benveniste defines non-regular fixed channel allocation as regular fixed channel allocation taking into account real-world performance characteristics, Yu's invention is a non-regular fixed channel allocation system as defined by Benveniste.

Benveniste suggests that Yu can be modified for Adaptive channel assignment. Yu does not teach Adaptive channel assignment, but clearly teaches of non-regular fixed channel allocation. Benveniste discloses that non-regular fixed channel allocation, when performed periodically, is Adaptive channel assignment (column 6 line 49 to column 7 line 4). The appellant has made no showing of why Yu's non-regular fixed channel allocation could not be performed periodically, hence the examiner maintains that Yu's system is able to be modified for the adaptive allocation of channels per Benveniste. As such, it is disagreed that Yu teaches away.

As per B: The Examiner agrees with the appellant that Benveniste's invention is geared toward an Adaptive-Dynamic Channel Assignment (ADCA) system for allocating channels among cells within a wireless communications system. Although, the Examiner would like to add that the cells of Benveniste's wireless communications system are sectorized (column 3 lines 12-19). The appellant primarily argues that the Examiner has not made a convincing line of reasoning as to why the combination of Yu and Benveniste render the applicant's invention of the dynamic re-allocation of channels among sectors in a cell obvious.

Benveniste identifies that fixed and flexible channel allocation differ both in the nature of the problem they are utilized for and in their operation (column 1 line 45 to column 2 line 6). Fixed channel allocation is concerned with the problem of efficient utilization of the RF spectrum for an indefinite period of time. It operates under the premise that the allocated groups of channels are fixed to the area they are assigned (column 1 line 45 to column 2 line 6). Flexible channel allocation is concerned with short-term variations (i.e., variation due to random nature of calls and trend changes in the average number of calls per cell) and operates under the premise that assigned groups of channels can adopt to traffic variations (column 1 line 45 to column 2 line 6). Yu is limited to fixed channel allocation and therefore does not take into account short-term variations. In an ideal environment, there is no change in load among cells or sectors, thus fixed channels allocation is sufficient. However, Benveniste teaches that traffic loads in real world situations vary and that flexible channel allocation can be used to solve short-term load variations (column 7 lines 6-46). Benveniste defines the pure use of flexible channel allocation as dynamic channel assignment (column 7 lines 6-46). As discussed above, Benveniste suggests the modification of Yu to perform adaptive channel assignment. Even further, Benveniste discloses a hybrid of adaptive and dynamic channel assignment called Adaptive-Dynamic Channel Assignment (ADCA) (column 7 line 49 to column 8 line 37). However, Benveniste's Adaptive-Dynamic Channel Assignment (ADCA) system allocates channels among cells instead of sectors. Nevertheless, Yu teaches shifting the use of fixed channel assignment from cells of a cellular system to

sectors of a cell. Hence, Yu's teaching enables one of ordinary skill in the art to recognize that Benveniste's Adaptive-Dynamic Channel Assignment can be taken from the cellular level and used to enhance Yu on the sectorized level.

The combination of the two types of channel assignment is both beneficial and possible because the two differ both in the nature of the problem they are utilized for and in their operation. Further the combination would simultaneously provide a solution for both long-term and short term variations. Therefore there is ample motivation to modify Yu to utilize Adaptive-Dynamic Channel Assignment for it would provide an improvement over Yu's fixed channel assignment.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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